

Patent Claims

1. A membrane filter system, comprising at least one
5 vessel in which there are arranged a plurality of
aerated filter modules (7) through which medium can
flow in parallel and which can be removed individually
from the membrane filter system, one filter module
comprising a plurality of identical membrane units,
10 characterized in that the vessel is divided into a
plurality of spaces by plates arranged normally with
respect to the direction of flow through the filter
modules (7), at least one space (3; 9; 13; 14) serving
for the common supply of suspension (10) that is to be
15 filtered to the plurality of filter modules (7), for
the common discharging of retentate (6) or for the
common discharging of permeate (1).

2. The system as claimed in claim 1, characterized in
20 that in the vessel there is a permeate space (9) which
surrounds the filter modules (7) and is closed off both
with respect to the suspension that is to be filtered
and with respect to the retentate (6), and the filter
modules are designed in such a way that the permeate
25 (1) emerges into the permeate space (9).

3. The system as claimed in claim 1 or 2,
characterized in that a feed space (13) is formed,
which encloses at least the inlet-side end faces of all
30 the filter modules (7) and is connected to the
individual filter modules (7) for the purpose of
feeding in suspension that is to be filtered.

4. The system as claimed in one of claims 1 to 3,
35 characterized in that a retentate space (3) is formed,
which encloses at least the outlet-side end faces (4)
of all the filter modules (7) and is connected to the
individual filter modules (7) for removing retentate.

5. The system as claimed in one of claims 1 to 4, characterized in that the feed space (13) has at least one feed distribution space (12) which runs at least partially around the feed space.

6. The system as claimed in claim 5, characterized in that the suspension that is to be filtered can penetrate into the feed space (13) from a feed distribution opening (14).

7. The system as claimed in one of claims 1 to 6, characterized in that an aeration device (15) around which the suspension that is to be purified flows is arranged in the feed space (13).

8. The system as claimed in one of claims 1 to 7, characterized in that a tap-off device (16) for emptying the filtration device and/or removing contaminants is provided in the feed distribution space (12).

9. The system as claimed in one of claims 1 to 8, characterized in that an air pulse line (17), which can be used to introduce an air pulse into the feed space, is arranged in the feed space (13).

10. A method for operating the membrane filter system as claimed in one of claims 1 to 9, characterized in that the reduction in the weight of the fluid column of the suspension in the filter module (7) which is achieved as a result of the gasification compensates for the pressure difference between the inlet and outlet of the membrane filter module caused by the friction loss of the flow.

11. A method for cleaning the membrane filter system as claimed in one of claims 1 to 9, characterized in

that permeate is back-flushed through the membrane surface of the filter modules (7), counter to the production direction, at periodic intervals in order to clean the membrane filter system.

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12. The method as claimed in claim 10, characterized in that a cyclical blast of air is introduced through an air pulse line (17) into the feed space (13) and therefore onward into the filter modules (7) in order to clean the membrane filter system.

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13. The method as claimed in either of claims 11 and 12, characterized in that the suspension that is to be filtered is removed from the feed space (13) of the membrane filter system, in that permeate is back-flushed through the filter modules (7) and is aerated via the aeration device (15) and/or mixed with one or more chemical cleaning solutions, and in that the contaminated flushing water is pumped out.

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